

## ABSTRACT

A stimuli-responsive, hybrid hydrogel wherein the bulk of the polymer is made up of relatively inexpensive water soluble polymer strands crosslinked by protein domains. The  
5 responsiveness of the gel is controlled or modulated by the protein component.

The physical and biological properties of the hydrogel are determined by specifically designed or engineered protein domains.

10 The crosslinking of the protein domains to the water soluble polymers is by means of non-covalent bonding such as chelation or coordination bonding, biotin-~~avidin~~ <sup>avidin</sup> bonding, protein-protein interaction and protein-ligand interaction, or by means of  
15 covalent bonding. Methods of making and using the polymer-protein hydrogels are disclosed in this application.

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